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**APPLICATION  
FOR  
UNITED STATES PATENT**

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**Title:** ARCHERY BOW SIGHT

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**SPECIFICATION**

## **ARCHERY BOW SIGHT**

### **Field of the Invention**

This invention relates generally to the field of archery and more particularly to an archery bow sight having sight or aiming pins.

### **Background of the Invention**

5           Archery bow sights utilizing a plurality of sight pins have been known in the art for many years. Typically, these sights utilize a bracket or other mounting structure for mounting the sight to a bow and a plurality of sight pins secured to structure such as a pin plate. The sight pins have aligned ends visible to the archer. The sight is mounted to the bow in a manner so that when the bow is drawn, the archer can  
10   look through a peep sight provided in the bow cable and align the tip or end of one of the sight pins attached to the sight with the target. For sights utilizing a plurality of sight pins having their tips vertically aligned, each individual sight pin is typically provided for aiming the bow at a target at a particular distance from the archer. For

example, one pin may be positioned in the sight for aiming the bow at a target at fifty yards from the archer, while another pin may be positioned for a target that is a hundred yards from the archer.

One difficulty with such archery bow sights is that the sight pins are  
5 commonly horizontally mounted in a manner shown in U.S. Patent Nos. 6,000,141;  
6,508,005; and 5,231,765. Sight pins mounted in this horizontal manner may obstruct  
the view of the archer and therefore adversely affect his or her shooting accuracy.

Another difficulty with known bow sights is that during low light  
conditions, such as early morning or late evening, the archer may have difficulty  
10 selecting the correct sight pin to use to aim at the target. Since many shots present  
themselves during these low light conditions, for hunters it is particularly important for  
the archer or hunter to be able to accurately identify the correct sight pin to use for the  
particular distance involved. Bow sights have been designed which utilize fiber optic  
elements illuminated by one or more light emitting diodes ("LEDs"). U.S. Patent No.  
15 6,494,604 discloses an archery bow sight system in which the archer pushes a button to  
select which fiber optic element to illuminate. One difficulty with such a complicated  
system is that the archer must push the button the correct number of times to illuminate  
the correct fiber optic element, a difficult thing to do with gloves in cold temperatures  
while sitting in a tree stand. Therefore, there is a need for an archery bow sight which  
20 utilizes multiple sight pins which are easily seen in low light conditions by the archer.

Another drawback with known archery bow sights is that archery bow  
sights which are adjustable both vertically and horizontally have multiple parts which  
must be secured together. U.S. Patent Nos. 6,494,604 and 6,508,005 disclose such bow  
sights. Over time or with repeated use, one or more of these parts or pieces of the  
25 archery bow sight may become loose and therefore create vibration and/or noise when

an archer takes a shot or releases an arrow. Therefore, there is a need for an archery bow sight which is rigid in construction, yet lightweight, which does not vibrate or make noise when the bow is used.

### **Summary of the Invention**

5                   The invention of this application which accomplishes these and other objectives comprises a bow sight which enables an archer to easily and quickly illuminate sight pins of the bow sight for use in low light conditions. The bow sight has three principal components: a mounting bracket, an adjustment rod and a main body which cooperate to enable the main body of the bow sight to be adjusted horizontally or  
10   vertically. Additional components of the bow sight include sight pins which extend downwardly into a circular passageway through the main body of the bow sight and set screws which are used to fix the position of the sight pins. Fiber optic elements extend from the ends of the sight pins to a conduit in the main body of the bow sight. The fiber optic elements are illuminated by a light emitting diode (hereinafter "LED") powered by  
15   one or more batteries.

                  The mounting bracket of the bow sight is mounted to a bow in conventional fashion. The mounting bracket has a hole therethrough which is sized to receive the adjustment rod. A clamp is inherently formed in the mounting bracket so that one may fix the position of the adjustment rod relative to the mounting bracket by  
20   tightening a fastener in a bore in the mounting bracket.

                  The adjustment rod extends between the mounting bracket and the main body of the sight. The adjustment rod has a dovetail receptacle formed in one end thereof which receives a dovetail projection of the main body of the bow sight. A clamp is inherently formed in the adjustment rod proximate the dovetail receptacle so that one

may fix the position of the main body relative to the adjustment rod by tightening a fastener in a bore in the adjustment rod.

The main body of the bow sight has a circular passageway therethrough which the archer looks through before firing an arrow. Additionally, the main body has a  
5 vertically oriented dovetail projection on one side of the main body which is slidable in the dovetail receptacle of the adjustment bar. A plurality of pin tracks extend downwardly from an upper surface of the main body into the circular passageway. In one preferred embodiment, four pin tracks arranged in a linear manner are formed in the main body. However, the main body may have any number of pin tracks in any desired  
10 configuration.

A plurality of sight pins are secured in the sight pin tracks with fasteners. A plurality of fastener tracks communicate with the pin tracks. Set screws pass through the fastener tracks and may be tightened against the sight pins to secure the sight pins in place or fix their position. Any other type of mechanism for securing the sight pins in  
15 place may alternatively be used. Each of the sight pins has a lower pin head which comprises a circular hole. The sight pins are secured or fixed in position with the set screws such that the pin heads or lower ends of the sight pins are fixed at different vertical heights or staggered. This enables an archer to vertically adjust one sight pin and fix it in a position so when this pin head is located on a target a fixed distance away,  
20 the bow shoots accurately. Similarly, a different sight pin is fixed so that when its pin head is located on a target at another fixed distance, the bow shoots accurately. Depending on the relevant distances encountered by the archer, the distances for setting of the sight pins may be adjusted accordingly.

Each of the sight pin heads may be illuminated by the archer by simply  
25 turning a knob on top of the bow sight of the present invention. The knob has a threaded

portion which is received in a housing and covers the top of the housing. The housing is partially received in a battery receptacle in the main body of the bow sight. At least one battery and an LED below the battery are located in the housing.

Activation of the LED causes illumination of a plurality of fiber optic  
5 elements. Each of the fiber optic elements has a first end which is secured to one of the pin heads of one of the sight pins. Similarly, each of the fiber optic elements has a second end which is located proximate the LED in a conduit in the main body of the bow sight. This conduit in the main body of the bow sight extends between the battery receptacle and the circular passageway of the main body. Each of the sight pins of the  
10 bow sight is equipped with a fiber optic element of a different color so that the archer may easily distinguish between sight pins, even in low light conditions.

In order to illuminate the fiber optic elements to more easily see the pin heads of the sight pins an archer simply needs to rotate the knob on top of the main body of the bow sight. Rotation of this knob establishes contact between the threaded stem of  
15 the knob, the battery or batteries in the battery receptacle and the LED, thereby activating the LED and illuminating all the fiber optic elements. Because the fiber optic elements are different colors, the archer may easily distinguish between sight pins and place the correct sight pin head on the target depending on the distance between the archer and the target.

## 20 **Brief Description of the Drawings**

These objectives and features of the invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of a bow having a bow sight according to this invention secured to the bow;

Fig. 2 is a disassembled perspective view of a portion of the bow sight of the present invention;

5 Fig. 3 is a partially disassembled perspective view of the bow sight of the present invention;

Fig. 4 is a disassembled perspective view of the bow sight of the present invention;

10 Fig. 5 is an assembled perspective view of a portion of the bow sight of the present invention; and

Fig. 6 is a cross-sectional view taken along the line 6-6 of Fig. 5.

### **Detailed Description of the Invention**

Referring to the drawings and particularly to Fig. 1, there is illustrated a bow sight 10 for use on a bow 12. The bow 12 is not intended to form part of the  
15 present invention; the bow sight 10 of the present invention may be used on any bow.

Referring to Fig. 2, the bow sight 10 of the present invention has three principal components: a mounting bracket 14, an adjustment bar 16 and a main body 18. As is conventional, the mounting bracket 14 is secured to the bow 10 with fasteners (not shown) which pass through openings 20 in the mounting bracket 14.

20 Each of these principal components, the mounting bracket 14, adjustment bar 16 and main body 18 is preferably made of anodized aluminum, but may be made with any other suitable material.

The mounting bracket 14 has a first or rear end 21 and a second or front end 22. Similarly, the mounting bracket 14 has a front surface 23, a rear surface 24, a

top surface 25, a bottom surface 26 and a pair of side surfaces 27 which define the thickness T of the mounting bracket 14. A circular hole 28 having a fixed diameter extends through the mounting bracket 14 proximate the front end 24. A clamp 29 is integrally formed in the front end 24 of the mounting bracket 14 by a gap 30 in the material of the mounting bracket which defines an upper portion 32 and a lower portion 34 of the front end 24 of the mounting bracket 14. A bore 36 extends through both the upper and lower portions 32, 34 of the front end 24 of the mounting bracket 14. The bore 36 having a threaded interior (not shown) is sized and adapted to receive a threaded fastener 38. Although one type of fastener is illustrated, any other fastener may be utilized in order draw the upper and lower portions 32, 34 of the front end 24 of the mounting bracket 14 together in order to secure the adjustment bar 16 in the hole 28 in the mounting bracket 14. See Fig. 3.

The adjustment bar 16 has pair of opposed end surfaces 40 which define the length L of the adjustment bar 16. The adjustment bar 16 has a generally cylindrical shape including an arcuate outer surface 42 and a flat 44 with gradations or markings 46 to enable one to easily mark the desired placement of the adjustment rod 16 relative to the mounting bracket 14. The adjustment bar 16 is sized to fit through the hole 28 in the mounting bracket 14 and be fixedly secured therein upon tightening of the clamp 29 at the front end 24 of the mounting bracket 14. The adjustment bar 16 has a first end 48 and a second end 50 in which is formed a dovetail receptacle 52. At the second end 50 of the adjustment bar 16 is located a clamp 54 comprising two halves or portions 56, 58 located on opposite sides of the dovetail receptacle 52, a bore 60 have a threaded interior (not shown) and extending through both portions 56, 58 of the clamp 54 and a threaded fastener 62 adapted to be received in the threaded interior of the bore 60. Although one type of fastener is illustrated, any other fastener may be utilized in order

draw the portions 56, 58 of the end 50 of the adjustment bar 16 together in order to secure the adjustment bar 16 to the main body 18 in a manner described below. See Fig. 3.

In order to secure the adjustment bar 16 and mounting bracket 14 together one slides the adjustment bar 16 through the hole 28 in the mounting bracket 14 and horizontally adjusts the adjustment bar 16 to its desired position. Using the clamp 29 of the mounting bracket 14 one tightens the fastener 38 in the bore 36 of the mounting bracket 14 to squeeze the opposed portions 32, 34 of the mounting bracket 14 together around the adjustment bar 16. See Fig. 3.

The main body 18 of the bow sight 10 has a generally planar upper surface 64, a front surface 66, a rear surface 68, a first side surface 70 and a second side surface 72. A dovetail projection 74 extends outwardly from the side surface 70 of the main body 18 and is integrally formed therein. A plurality of markings 76 are located on the dovetail projection 74 to enable one to easily mark the desired placement of the adjustment rod 16 relative to the main body 18.

In order to secure the adjustment bar 16 and main body 18 together one slides the dovetail projection 74 inside the dovetail receptacle 52 of the adjustment bar 16 and vertically adjusts the main body 18 to its desired position. Using the clamp 54 of the adjustment bar 16 one tightens the fastener 62 in the bore 60 of the adjustment bar 16 to squeeze the opposed portions 56, 58 of the adjustment bar 16 together around the dovetail projection 74 of the main body 18. See Fig. 3.

In order to reduce the weight of the bow sight 10 generally and more particularly the weight of the main body 18, recesses 78 are integrally formed in an upper portion 79 of the main body 18. Although one configuration of recess is illustrated, the recesses may assume other configurations or be omitted entirely.

The main body 18 has a lower circular portion 80 including a circular passageway 82 therethrough. The lower circular portion 80 includes arcuate rails 84, 86 and a connector rail 88. In order to reduce the weight of the bow sight 10 generally and more particularly the weight of the main body 18, slots 90 are integrally formed in the lower portion 80 of the main body 18. Although one configuration of slot 82 is  
5 illustrated, the slots may assume other configurations or be omitted entirely.

As best illustrated in Figs. 3, 4 and 6, a plurality of aligned sight pin tracks 92 extend downwardly from the upper surface 64 of the main body 18 to the circular passageway 82 of the main body 18. Although four sight pin tracks 92 are  
10 illustrated and described, the bow sight 10 of the present invention may have any number of sight pin tracks 92. As shown in Figs. 4 and 5, each of the sight pin tracks 92 is sized and adapted to receive a sight pin 94.

Each of the sight pins 94 is preferably made of stainless steel, but may be made with any other suitable material. As best illustrated in Figs. 3 and 4, each of the  
15 sight pins 94 is identically configured having a generally cylindrical upper portion 96 and a linear lower portion 98. The lower end of the linear lower portion 98 ends in a pin head comprising a circular hole 100 whose function will be described in more detail below. The upper portion 96 of each sight pin 94 has a flattened generally planar upper surface 102 and a flattened generally planar side surface 104. The sight pins 94 are  
20 preferably oriented such that the side surfaces 104 of the sight pins 94 are facing the side surface 72 of the upper portion 80 of the main body 18 of the bow sight 10. Although one configuration of sight pin is illustrated and described, the sight pin may assume any other configuration without departing from the spirit of this invention.

As best illustrated in Fig. 4, a plurality of fastener tracks 106 extend  
25 inwardly from the side surface 72 of the upper portion 79 of the main body 18. Each of

these fastener tracks 106 extends into and communicates with one of the sight pin tracks 92. Although four fastener tracks 106 are illustrated and described, the bow sight 10 of the present invention may have any number of fastener tracks 106. As shown in Figs. 4 and 5, each of the fastener tracks 106 is sized and adapted to receive a fastener 108. One  
5 type of fastener which may be utilized is a set screw as illustrated. However, other types of fasteners may be used in accordance with the present invention. As shown in Fig. 3, each of the set screws 108 has a flattened end 110 which abuts the side surface 104 of one of the sight pins 94 to secure or fix the sight pin 94 in place. As shown in Fig. 4, the fastener tracks 106 are arranged in a diagonal manner; however they may be oriented in  
10 any desired manner such as for example aligned horizontally.

As illustrated in Figs. 3, 4 and 6, the upper portion 79 of the main body 18 of the bow sight 10 has a threaded battery receptacle 112 therein. This battery receptacle 112 extends downwardly from the upper surface 64 of the main body 18. A cap assembly 114 engages the threaded battery receptacle 112 of the main body 18 of  
15 the bow sight 10.

The cap assembly 114 comprises an upper knob or cap 116 having a threaded stem 117, an O-ring 127, batteries 128 inside a plastic sleeve 126, an insulator sheet 125, an LED 124 and a housing 118. The housing 118 has an upper portion 121 and a lower threaded portion 120. The threads 6 on the threaded lower threaded portion  
20 120 engage the threads 122 inside the battery receptacle 112 in a known manner. As best illustrated in Figs. 3 and 4, the LED 124, insulator sheet 125, plastic sleeve 126 and batteries 128 are located in the housing 118. The housing 118 has a threaded upper inside surface 7 which receives the threaded stem 117 of the upper knob 116. The batteries 128 are located inside the plastic sleeve 126 in the housing 118 for noise  
25 prevention and/or reduction. In one embodiment, the batteries are 1.55 volts; however

they may be any desired size or voltage. The insulator sheet 125 is preferably plastic such as mylar but may be any suitable material. The LED is preferably 3 millimeters in diameter but may be any size and/or configuration.

As illustrated in Fig. 6, a conduit 130 integrally formed in the main body 18 of the bow sight 10 extends between the lower end of the battery receptacle 112 and the circular passageway 82 of the main body 18. Fiber optic elements 132 extend between the conduit 130 and the pin heads or ends 100 of the sight pins 94. More specifically, each fiber optic element 132 has a first end 134 located in the conduit 130 and a second beaded end 136 abutting the circular hole 100 formed in the lower end of each sight pin 94. The bead 135 formed in the second end 136 of each fiber optic element 132 is of sufficient diameter or size so that it may not pass through the circular hole 100 formed in the lower end of each sight pin 94. Although the drawings illustrate four fiber optic elements 132, the present invention may utilize any number of fiber optic elements. Preferably, each fiber optic element 132 is a different color. However, they may be the same color if desired. The fiber optic elements 132 may be any desired diameter. In one embodiment of the present invention, the fiber optic elements 132 have a diameter of .03 inches. In another embodiment of the present invention, the fiber optic elements 132 have a diameter of .019 inches.

To illuminate the fiber optic elements 132, the archer simply rotates the upper knob 116 of the cap assembly 114, thereby establishing contact between the cap 116, the batteries 128 and the LED 124. The insulator sheet 125 has an opening therethrough which enable one of the leads of the LED 124 to contact the lowermost battery while the other lead of the LED 124 contacts the housing 118. This action completes an electronic circuit which activates the LED 124 and causes the fiber optic elements 132 to illuminate. Illumination of the fiber optic elements 132 and particularly

the second beaded ends 136 thereof, enables the archer to easily distinguish between sight pins 94. Thus, with a slight rotation of the upper knob 116, the archer may illuminate the pin heads 100 of the sight pins 94 in order to more easily pick the correct sight pin to place on the target.

5                   While I have described one embodiment of the present invention, persons skilled in the art will appreciate changes and modifications which may be made without departing from the spirit of this invention. Therefore, I do not intend to be limited except by the scope of the following claims.

I claim: